

Community News

JSC scientists reach out, help local students, seniors

By Elizabeth Soutter

With the help of two NASA engineers, four Friendswood Junior High School seventh-graders have built a motorized walker-on-wheels that is earning them high accolades and a pending U.S. Patent.

The four students—Tessa Herrera, Brian Ayers, Justin Zendt and Jenny Ayers, daughter of Johnny Conkin, a University Space Research Association's visiting scientist—got together to enter a contest Herrera had read about in "Discover" magazine last January.

The "Bayer-National Science Foundation Contest for Community Innovation" was calling for sixth, seventh and eighth graders in groups of four to design science projects that would better their communities. The contest was sponsored by Bayer, Space Center Houston, the National Science Foundation and Disney World. Herrera and the others asked their science teacher, Carol Lee, to be their sponsor.

The Friendswood four began their project by interviewing residents at the Friendswood Retirement Center. The seniors they interviewed expressed a common need: an easier method of traveling small distances along hallways.

The most common method of moving around the Senior Center is to use a walker. This is a lightweight metal frame that provides support as the user walks. A standard walker must be lifted with each step the user takes, making it cumbersome. Additionally, the lifting motion was painful for those seniors who had arthritis. A standard walker also requires the use of both arms, which makes it difficult to carry anything. An alternative to a walker would be a wheelchair. The seniors prefer to have the option of walking.

The Friendswood kids took all of this data into account and came up with the idea for a motorized walker on wheels. They named their device "WOW," an acronym for Walker on Wheels, and submitted the design and an essay detailing their research to the contest. Each of the 10 contest regions in the United States selected three teams as semifinalists. The Friendswood four were among those selected from the region that included Texas. At the semifinalist luncheon at Space Center Houston, the Friendswood team was announced as the regional finalist and awarded \$250 to fabricate a WOW prototype.

Armed with a design and an idea, the Friendswood kids needed help implementing their project. Cathy Kramer, manager of the JSC Biomedical Hardware Development and Implementation Office, had participated with members of her office in several Educational Outreach programs at Friendswood Junior High School. Seventh grade science teacher Carolyn Lee remembered Kramer from events like National Engineer's

Week and the Science Fair and suggested they contact her for help.

Kramer and her husband, Bob, a senior JSC engineer with Hamilton Standard, agreed to help the four young scientists implement their design. Using their garage as a workshop, the Kramers spent five weekends working with the seventh graders.

"We agreed to help them with the design," Cathy Kramer said, "but they had to build it themselves."

The Kramers helped the kids modify the walker design so that it was feasible and incorporated all the elements the seniors had asked for. They started by constructing a platform of wooden planks and mounting it on wheels. The students made use of the power saws and drills the Kramers had in their home and many of the supplies came from the Kramers' garage. "My husband and I like to invent things, so we have a lot of gadgets," Kramer said.

After some experimentation the team found that cordless drills inserted into the right and left front wheels were a simple and effective way to power and navigate the unit. The drills were mounted on metal shafts that were high enough to be reached comfortably from a standing position. Squeezing the triggers of both drills propels the walker forward. To make a turn, the user can apply more power to the opposing side. This eliminates the cumbersome lifting action required of standard walkers but still provides comfortable, mobile support. A narrow platform on the unit provides the option of riding, and a bag on the front of the walker allows the user to transport small items easily.

The Friendswood kids finished WOW in time to dismantle it and load it onto a plane to Florida for the final judging. Once there, they set up a booth at Disney World's Epcot Center Innovations Exhibit. They staffed the booth for five days, answering questions about their design and talking to media and international visitors. When they were not acting as ambassadors for their project, they were being taken through the Disney World exhibits for a behind-the-scenes look at the engineering of attractions such as Haunted House and Space Mountain. This schedule was more demanding than the four had anticipated, and left little time to enjoy the park.

"They didn't think it would be so much work when they got there," Kramer said.

The 10 finalists' projects were judged on May 29. The majority of the other teams had worked on community recycling programs and other socially based projects.

"The parameters of the competition were not real clear," Kramer said. "Miss Lee thought for sure these kids had won. Everyone was coming by and video taping (the WOW), everybody was riding on it and manufacturing firms were passing out their cards."



JSC Photos 97-06958, 97-06959 by Steve Candler

With the help of NASA engineers, students from Friendswood Junior High School built a motorized walker-on-wheels. Above: From left are student Justin Zendt, Cathy Kramer, manager of the JSC Biomedical Hardware Development and Implementation Office, Seventh grade science teacher Carolyn Lee, and students Brian Ayers and Jenny Ayers. Left: Kramer and Lee with the new motorized walker-on-wheels.



Given that the majority of the projects were similar, contest officials decided to judge the projects on the basis of their socio-ecological value. Although they did not win, the Friendswood four did not go home empty-handed. Several companies expressed an interest in marketing the WOW, and the students have applied for a patent. In addition, contest officials classified the four and their project as automatic finalists for next year's contest. They also have entered two additional science competitions this summer.

"It's neat to see kids willing to give up their Saturdays and Sundays and work on something and see them thinking of senior citizens... they weren't focusing on themselves," Kramer said.

Kramer accompanied the crew to Florida with her 13 year-old son, Robert. She and her husband continue to watch the WOW project with interest to see where it will lead next.

Employees to expand knowledge in programs

Eleven JSC employees were selected for the 1998 Project IQ and JSC Fellowship Programs.

Employees who will participate in the Project IQ program are Yvonne Grimm and Esther McFarland of the Business Management Directorate, Jessica Cordero of Mission Operations, Frank Dacus and Ernest Romero of Engineering and Carmen Hollins and Betty Wallis of Space and Life Sciences.

Over the next two years, these employees will improve their skills and qualifications by attending college classes toward their undergraduate degree. In addition, they will be permitted up to eight hours duty time per week to attend classes. JSC will support these students by paying for their tuition, fees and text books.

Four JSC employees were selected to participate in the JSC Fellowship Program, which provides one year of full-time graduate study with salary.

Evelyne Orndoff of Engineering will attend North Carolina State

University working toward a doctorate in textile science and engineering; Charles Campbell of Engineering will go to the University of Minnesota working toward a doctorate in aerospace engineering and mechanics; Howard Wagner of Engineering will attend Rice University working towards a Ph.D. in Mechanical Engineering; and, Paul Marshall of the International Space Station Program Office will go to George Washington University working toward a master's of science in engineering management.

Criteria used for selections include the applicability of the chosen area of study and its effectiveness in contributing to the achievement of JSC's missions and goals, a brief statement of academic courses completed, the written recommendation of the division chief and the level of activity in the employee's office. JSC strongly supports this opportunity so employees may receive advanced academic training thus enhancing professional and personal growth.

JSC Safety Alert

Emergency Power-Off Button

What Happened

Recently, a person preparing to leave a room in Bldg. 30 South pushed an Emergency Power Off Button—a button used for emergency shutdown of critical computer equipment. Because the power was removed in an uncontrolled manner, the computer equipment was damaged. Had this incident occurred during a mission, critical data and monitoring capability could have been temporarily lost.

Outcome of Investigation

The Emergency Power Off Button is red with a red sign above it stating its intended use. Numerous rooms in Bldg. 30 South, and elsewhere across the center, are controlled areas. These areas require a button to be pushed to release the mechanism on the exit doors. Exit buttons and the signs above these exit buttons are usually both red. The individual mistook the red Emergency Power Off Button and sign for a red exit button and sign.

What You Can Do

First and most obvious, always know what a button or switch is supposed to do before you push it. Never push a button, or turn a switch, with the intent of finding out what it does. Second, look around your work area to verify that all switches and buttons are clearly and distinctly labeled. Also, make sure that all of the area occupants (including guests) understand what each switch or button is supposed to do. Pay particular attention to those buttons or switches that may play a role in critical/emergency situations. Last, consider human factors when designing, positioning and labeling switches and buttons. Further safeguards have been placed on the Emergency Power Off switches, including the addition of a pull ring on the cover. It is hoped this additional pull ring will cause a potential user to be certain of his/her actions before they push the button. Additionally, the color of the sign above the switch has been changed to distinguish it further from exit signs.